

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Previously Presented) A communication method for a noncontact RF ID system comprising:

communicating a data sequence having a first waveform which corresponds to one of codes "0" or "1" and which has a length of time T ;

communicating a data sequence having a second waveform which corresponds to the other of said codes "0" or "1" and which has a length of time T ; and

communicating a data sequence having a third waveform which corresponds to m (m is a natural number equal to or greater than 2) codes that are the same as the codes of the second waveform and where the third waveform has a length of time mT , wherein

the first waveform with 50% duty ratio is in a low level state at a starting point, is in a high level state at an end point and rises only at a position of $T/2$,

the second waveform with 50% duty ratio is in a high level state at a starting point, is in a low level state at an end point and rises only at a position of $T/2$, and

the third waveform with 50% duty ratio is in a high level state at a starting point, is in a low level state at an end point and rises only at a total of m positions of $T/2 + nT$ ($n=0, \dots, m-1$).

2. (Previously Presented) A communication method for a noncontact RF ID system comprising:

communicating a data sequence having a first waveform which corresponds to one of codes "0" or "1" and which has a length of time T ;

communicating a data sequence having a second waveform which corresponds to one of codes "0" or "1" opposite to the first waveform and which has a length of time T ; and

communicating a data sequence having a third waveform which corresponds to m (m is a natural number equal to or greater than 2) codes that are the same as the codes of the second waveform and which has a length of time mT , wherein

the first waveform with 50% duty ratio is in a high level state at a starting point, is in a low level state at an end point and falls only at a position of $T/2$,

the second waveform with 50% duty ratio is in a low level state at a starting point, is in a high level state at an end point and falls only at a position of $T/2$, and

the third waveform with 50% duty ratio is in a low level state at a starting point, is in a high level state at an end point and falls only at a total of m positions of $T/2 + nT$ ($n=0, \dots, m-1$).

3. (Cancelled)

4. (Previously Presented) A communication method for a noncontact RF ID system according to claim 1, wherein:

in the case in which the state transition is rising, the first waveform is a waveform that maintains a low level in a negative time direction for $T/2$ from the point in time that the waveform first rises, which is a center point of the waveform, and maintains a high level state for $T/2$ in a positive time direction from this center point;

the second waveform is a waveform that maintains a high level state in the positive time direction for t_1 from a point in time that the waveform first rises, which is the center point of the waveform, maintains a low level state for time t_2 until an end point of the waveform, maintains a low level state in the negative time direction for time t_1 from the center point of the waveform, and maintains a high level state for time t_2 until a starting point of the waveform (here, t denotes time, T denotes one cycle of the first and second waveforms, and $t_1 + t_2 = T/2$); and

the third waveform is a $C(2n)$ waveform which, in the case in which $m=2n$, maintains a high level state in the positive time direction for t_6 from the point in time that the waveform first rises; maintains a low level state in the negative time direction for t_3 from the point in time that the waveform first rises; maintains a high level state for time t_4 until the starting point of the waveform; maintains a high level state in the positive time direction for $t\{2(n-k)+6\}$ from the point in time that the waveform rises for the $(n+1-k)$ th time; maintains a low level state for $t\{2(n-k)+3\}$ in the negative time direction from the point in time that the waveform rises for the $(n+1-k)$ th time; maintains a high level state in the positive time direction for $T/2$ from the point in time that the waveform rises for the n th time; maintains a low level state in the negative time direction for $t\{2(n-1)+3\}$ from the point in time that the waveform rises for the n th time; maintains a high level state in the positive time direction for $t\{2(n-1)+3\}$ from the

point in time that the waveform rises for the $(n + 1)$ th time; maintains a low level state in the negative time direction for $T/2$ from the point in time that the waveform rises for the $(n + 1)$ th time; maintains a high level state in the positive time direction for $t\{2(n - k) + 3\}$ from the point in time that the waveform rises for the $(n + k)$ th time; maintains a low level state in the negative time direction for $t\{2(n - k) + 6\}$ from the point in time that the waveform rises for the $(n + k)$ th time; maintains a low level state in the negative time direction for t_6 from the point in time that the waveform rises the last time; maintains a high level state in the positive time direction for t_3 from the point in time that the waveform rises the last time; and maintains a low level state for time t_4 until an end point of the waveform, where n and k are natural numbers; $n \geq k \geq 1$; t is time; T is one cycle of the first and second waveforms; and $t_3 + t_4 = T/2$; $t\{2(n - k) + 5\} + t\{2(n - k) + 6\} = T$ (when n and $k \geq 2$); and

in the case in which $m = 2n + 1$, the third waveform is a $C(2n + 1)$ waveform that maintains a high level state in the positive time direction for t_6 from the point in time that the waveform first rises; maintains a low level state in the negative time direction for t_3 from the point in time that the waveform first rises; maintains a high level state for t_4 from the starting point of the waveform; maintains a high level state in the positive time direction for $t\{2(n - k) + 6\}$ from the point in time that the waveform rises for the $(n + 1 - k)$ th time; maintains a low level state in the negative time direction for $t\{2(n - k) + 3\}$ from the point in time that the waveform rises for the $(n + 1 - k)$ th time; maintains a high level state in the positive time direction for $t\{2(n - 1) + 5\}$ from the point in time that the waveform rises for the $(n + 1)$ th time; maintains a low level state in the negative time direction for $t\{2(n - 1) + 5\}$ from the point in time that the waveform rises for the $(n +$

1)th time; maintains a high level state in the positive time direction for $t\{2(n - k) + 3\}$ from the point in time that the waveform rises for the $(n + 1 + k)$ th time; maintains a low level state in the negative time direction for $t\{2(n - k) + 6\}$ from the point in time that the waveform rises for the $(n + 1 + k)$ th time; maintains a low level state in the negative time direction for t_6 from the point in time that the waveform rises the last time; maintains a high level state in the positive time direction for time t_3 from the point in time that the waveform rises the last time; and maintains a low level state for t_4 until the end point of the waveform; (where n and k are natural numbers, $n \geq k \geq 1$, t is time, T is one cycle of the first and second waveforms, $t_3 + t_4 = T/2$, and $t\{2(n - k) + 5\} + t\{2(n - k) + 6\} = T$).

5. (Previously Presented) A communication method for a noncontact RF ID system according to 2, wherein:

in the case in which the state transition is a falling state transition, the first waveform is an inverted waveform that maintains a low level in a negative time direction for $T/2$ from the point in time that the waveform first rises, which is a center point of the waveform, and maintains a high level state for $T/2$ in the positive time direction from this center point;

the second waveform is an inverted waveform that maintains a high level state in the positive time direction for t_1 from the point in time that the waveform first rises, which is the center point of the waveform, maintains a low level state for time t_2 until the end point of the waveform, maintains a low level state in the negative time direction for time t_1 from the center point of the waveform, and maintains a high level state for time

t_2 until the starting point of the waveform (here, t denotes time, T denotes one cycle of the first and second waveforms, and $t_1 + t_2 = T/2$); and

the third waveform is an inverted $C(2n)$ waveform which, in the case in which $m=2n$, maintains a high level state in a positive time direction for t_6 from the point in time that the waveform first rises; maintains a low level state in the negative time direction for t_3 from the point in time that the waveform first rises; maintains a high level state for time t_4 until the starting point of the waveform; maintains a high level state in the positive time direction for $t\{2(n-k) + 6\}$ from the point in time that the waveform rises for the $(n+1-k)$ th time; maintains a low level state for $t\{2(n-k) + 3\}$ in the negative time direction from the point in time that the waveform rises for the $(n+1-k)$ th time; maintains a high level state in the positive time direction for $T/2$ from the point in time that the waveform rises for the n th time; maintains a low level state in the negative time direction for $t\{2(n-1) + 3\}$ from the point in time that the waveform rises for the n th time; maintains a high level state in the positive time direction for $t\{2(n-1) + 3\}$ from the point in time that the waveform rises for the $(n+1)$ th time; maintains a low level state in the negative time direction for $T/2$ from the point in time that the waveform rises for the $(n+1)$ th time; maintains a high level state in the positive time direction for $t\{2(n-k) + 3\}$ from the point in time that the waveform rises for the $(n+k)$ th time; maintains a low level state in the negative time direction for $t\{2(n-k) + 6\}$ from the point in time that the waveform rises for the $(n+k)$ th time; maintains a low level state in the negative time direction for t_6 from the point in time that the waveform rises the last time; maintains a high level state in the positive time direction for t_3 from the point in time that the waveform rises the last time; and maintains a low level state for time t_4 until the end

point of the waveform, where n and k are natural numbers; $n \geq k \geq 1$; t is time; T is one cycle of the first and second waveforms; and $t_3 + t_4 = T/2$; $t\{2(n - k) + 5\} + t\{2(n - k) + 6\} = T$ (when n and $k \geq 2$); and

in the case in which $m = 2n + 1$, the third waveform is an inverted $C(2n + 1)$ waveform that maintains a high level state in the positive time direction for t_6 from the point in time that the waveform first rises; maintains a low level state in the negative time direction for t_3 from the point in time that the waveform first rises; maintains a high level state for t_4 from the starting point of the waveform; maintains a high level state in the positive time direction for $t\{2(n - k) + 6\}$ from the point in time that the waveform rises for the $(n + 1 - k)$ th time; maintains a low level state in the negative time direction for $t\{2(n - k) + 3\}$ from the point in time that the waveform rises for the $(n + 1 - k)$ th time; maintains a high level state in the positive time direction for $t\{2(n - 1) + 5\}$ from the point in time that the waveform rises for the $(n + 1)$ th time; maintains a low level state in the negative time direction for $t\{2(n - 1) + 5\}$ from the point in time that the waveform rises for the $(n + 1)$ th time; maintains a high level state in the positive time direction for $t\{2(n - k) + 3\}$ from the point in time that the waveform rises for the $(n + 1 + k)$ th time; maintains a low level state in the negative time direction for $t\{2(n - k) + 6\}$ from the point in time that the waveform rises for the $(n + 1 + k)$ th time; maintains a low level state in the negative time direction for t_6 from the point in time that the waveform rises the last time; maintains a high level state in the positive time direction for time t_3 from the point in time that the waveform rises the last time; and maintains a low level state for t_4 until the end point of the waveform; (where n and k are natural numbers, $n \geq k \geq 1$, t is time, T is

one cycle of the first and second waveforms, $t_3 + t_4 = T/2$, and $t\{2(n - k) + 5\} + t\{2(n - k) + 6\} = T$.

6 – 13. (Cancelled)